

# - Boar taint detection -

## Development of sensors for rapid on-line slaughterhouse detection of boar taint an approach based on the analysis of VOC profiles

Burgeon C.<sup>a</sup>, Markey A.<sup>a</sup>, Debliquy M.<sup>b</sup>, Lahem D.<sup>c</sup>, Rodriguez J.<sup>b</sup>, Ly A.<sup>c</sup>, Fauconnier M-L.<sup>a</sup>

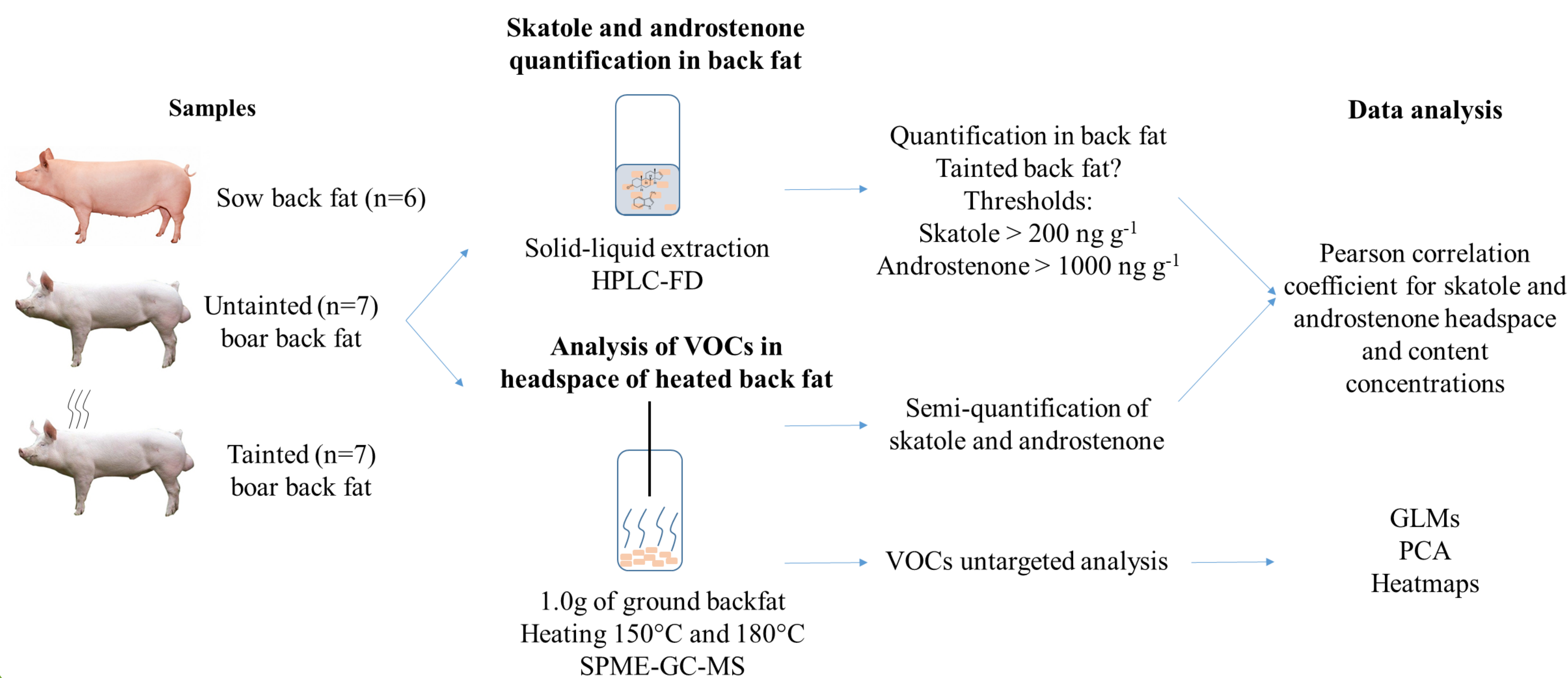
### Context and objectives

Boar taint is a unpleasant smell found in the meat of some entire male pigs. Skatole and androstenone stored in fat are mainly responsible of this smell. They are emitted when the meat is cooked, releasing a urine- and fecal- like odor. Currently, detection of tainted carcasses is performed in slaughterhouses with the human nose or a colorimetric method. Fast, cheap and accurate VOCs sensor-based methods are being developed to replace them.

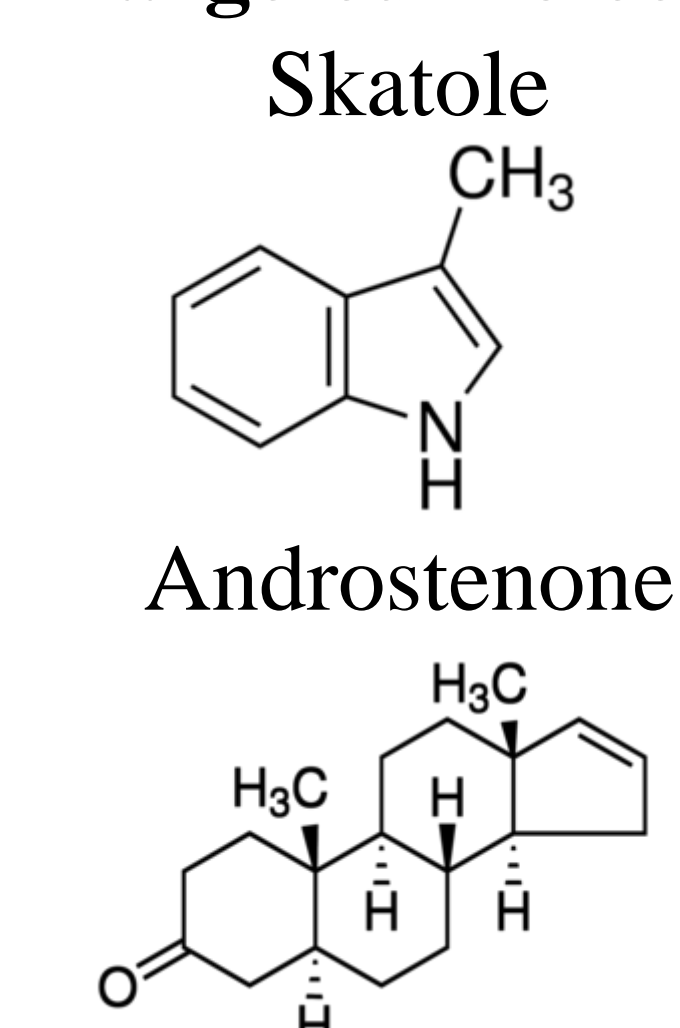
Elevated temperature VOC profiles are examined to:

- facilitate new sensor development.
- gain the understanding of VOCs perceived during current boar taint sensory evaluations.
- help in understanding which VOCs perceived by the consumers during the cooking of pork meat are lipid-derived.

### Method



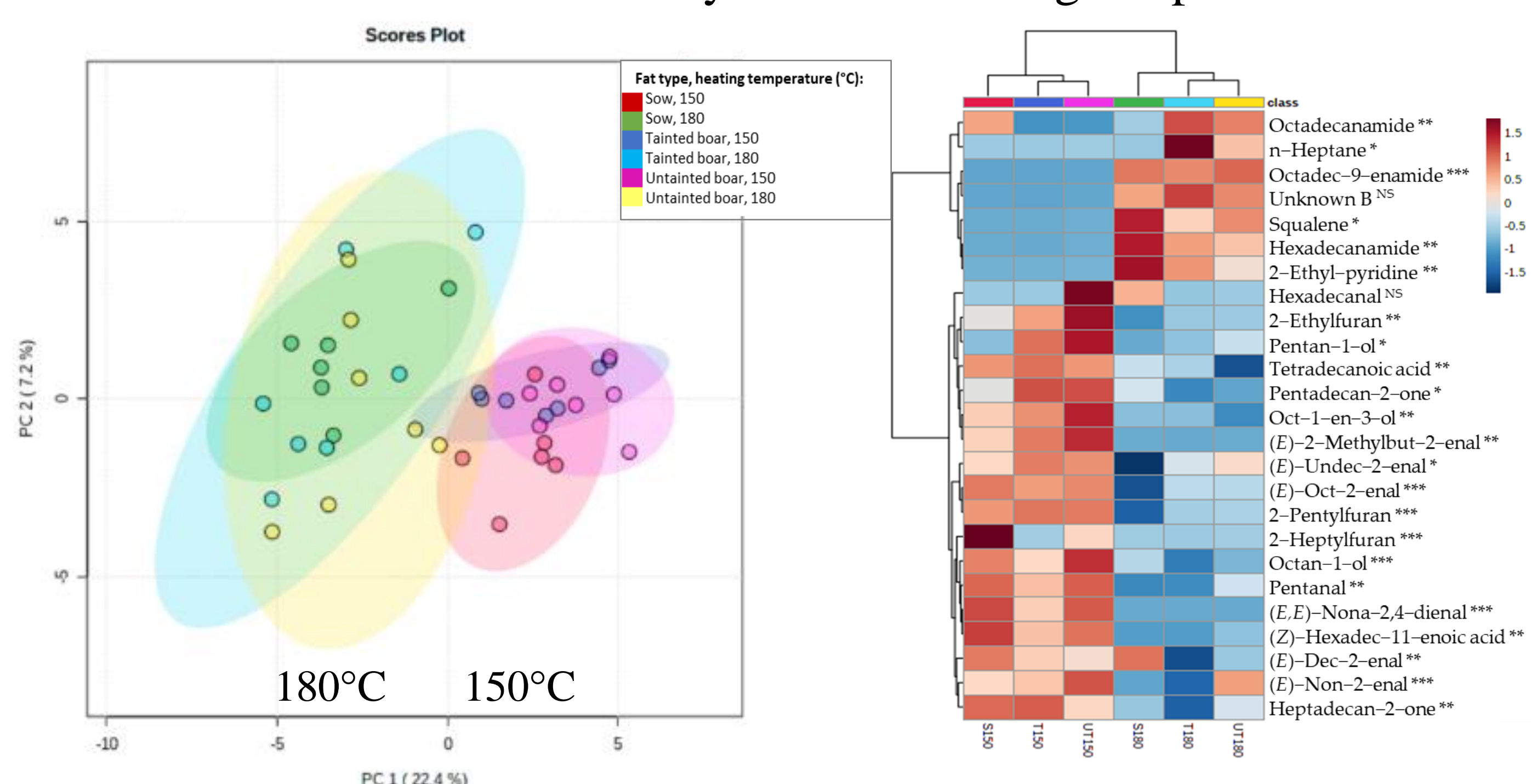
### Targeted molecules



### Results

#### Understanding differences between VOC profiles

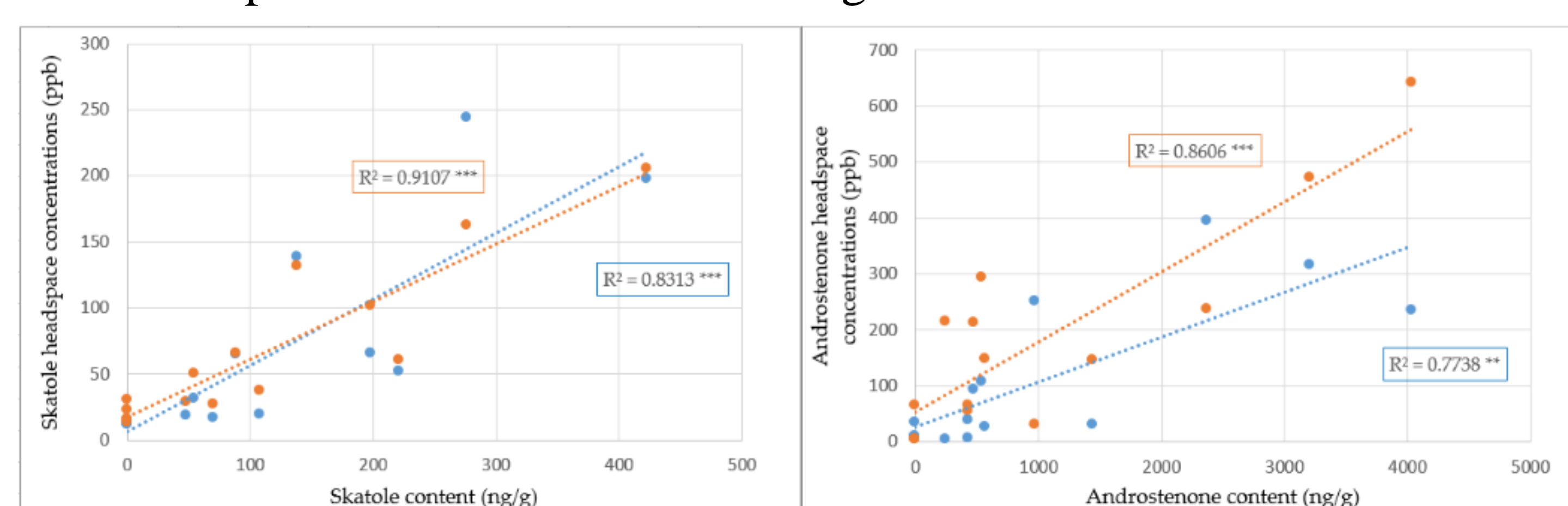
Differences → Mainly between heating temperatures.



Aldehydes in higher concentrations at 150°C → Further reaction at 180°C  
Amides in higher concentrations at 180°C → Pyrolysis of meat products  
Squalene present only at 180°C → Low vapour pressure

#### Detection of skatole and androstenone in the headspace of heated back fat

Headspace concentrations → Good representations of boar taint in fat  
Low headspace concentrations → Strong matrix effects



Similar trends at both temperatures  
→ Similar extraction yields

Increasing headspace concentrations with temperature  
→ Lower vapour pressure compared to skatole

### Conclusion

Great differences were observed between the VOC profiles depending on the incubation temperature. Different VOC profiles might result in differences in classification of the meat when heated at different temperatures. This stresses the need to develop and use a standardized method for the sensory evaluation of boar taint.

VOCs sensors for skatole and androstenone detection could be developed for incubation temperatures of 150 and 180°C since both molecules are found in the headspace. However, the low headspace concentration observed for both these molecules should encourage further research into higher incubation temperatures.

#### For more information

Find the article

Contact me



Burgeon Clément - cburgeon@uliege.be

#### Acknowledgements

The authors thanks the European Regional Development Fund (ERDF), the Walloon Region of Belgium and the AGROSENSOR project for their financial support.

The authors would also like to thank the following institutions:

<sup>a</sup> Laboratory of Chemistry of Natural Molecules, Gembloux Agro-Bio Tech, University of Liège,

<sup>b</sup> Service de Science des Matériaux, Faculté Polytechnique, University of Mons

<sup>c</sup> Materia Nova ASBL, Materials R&D Centre

Figures presented were created with [biorender.com](https://biorender.com) and excel.